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ARTICLE

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A co-design approach to service improvement resulted in teams exhibiting characteristics that support innovation

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ABSTRACT

This paper analyzes a subset of data from a project that sought to transfer knowledge and skills around design led approaches for service improvement to teams working in Health and Social Care in the United Kingdom. Through this analysis the authors sought to understand the range of responses that individual participants had to undertaking service improvement work in a design led project. This was a qualitative study using interviews to gain reflections from participants. These interview transcripts were analyzed using framework analysis. Participants were recruited from three disparate organizations, a public health team of a local authority, a mental health charity and a UK National Health Service mental health initiative. Six main themes were identified, namely; design practice, collaborative working, creating an environment for innovation, team skills and attitudes and transfer of knowledge. The findings suggest that the design approach can contribute to a range of factors that have been identified as valuable for innovative teams. The paper adds to the evidence base and supports further exploration of the use of design in Service improvement and wider innovation endeavours.

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Innovation; co-design; teams

Background

Healthcare context

Over the past 60 years, healthcare has changed dramatically. The population is living longer and experiencing more chronic conditions and complex needs. Responding to ever-changing healthcare needs requires a shift in the way healthcare and public health policy is designed and delivered (World Health Organization 2002). These changing needs require our health services to do things differently, to innovate. Innovation is the introduction and application of new and improved ways of doing things (West et al. 2004). Innovation is

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increasingly being recognized as requiring an organizational approach in the UK National Health service (NHS) with a focus on the patient (or stakeholder) at the centre (Dixon-Woods et al. 2013). There are many models for delivering innovation, but, particularly in response to the drive for person-centred approaches (Berwick 2013), the approach offered by design is gathering support (Asch and Rosin 2015) whilst more evidence around participatory designs' ability to promote person-centred behaviour (Wolstenholme et al. 2016) is reported.

Design in healthcare

The UK Design Council (2013) describes designing as a process that involves; researching user needs, visualizing solutions, prototyping and improving. Design is described as having three key attributes that distinguish it from other activities, namely: design makes ideas tangible, and those tangible artefacts provide further insights into the problem situation; design is human-centred, in that it is the perceived or unrecognized needs of the end user that drive the process; and design is collaborative (Hunter 2016). The term 'design thinking' has been used to describe these elements of design practice that are portable and can be used by different disciplines (Johansson-Sköldberg, Woodilla, and Çetinkaya 2013). Early explicit application of design in healthcare included work by the UK Design Council (Cottam and Leadbeater 2004) and Bate and Robert's ground-breaking work on experience-based design (2007).

User-centred healthcare design (UCHD)

It was against this background that the user-centred healthcare design (UCHD) project was funded by the UK National Institute for Health Research (NIHR) to explore how design theory and practice could be applied in healthcare (Wolstenholme et al. 2010; Bowen et al. 2011; Sustar et al. 2013). Over five years, the project conducted case studies applying design to healthcare challenges, during which time the UCHD team developed a set of guiding principles around the approach to working in health and social care as follows.

- Designing for *people* not patients: our approach recognizes that good service design begins with understanding people's lived experiences of health and social care. This means understanding people not just as service-users but human beings with feelings and wider goals (such as maintaining independence and dignity). It also recognizes that services have a much broader impact on people's lives than the clinical encounter.
- Designing *with* people: best practice in health research recognizes the importance of public and patient involvement (PPI) and we believe that such participation is about more than creating better services. Within participatory design (Schuler and Namioka 1993) it is recognized that including the users of systems or services in their design ensures that whatever is

designed is likely to be more effective as a result (as it is built on their in-depth knowledge), and that users have a right to be involved in design because they are affected by what is produced and such involvement empowers them. In healthcare, designing with those who access or provide services utilizes their specialist knowledge and gives those people a strong voice in how those services should change. This last aspect is essential if changes are to be sustainable on the ground, and

- Designing for *innovation*: going beyond service improvement to service innovation requires the exploration of alternative futures that encourage people to expand their horizons and explore different possibilities. This is a key strength of design or, more particularly, *making*. Designers make alternatives visible and accessible and, through *co*-designing, participants focus on solutions rather than problems (particularly useful in healthcare where it is difficult to completely describe the complex problems encountered). Such creative activity is then a form of thinking – making to enquire into and refine what should be designed (Gedenryd 1998).

Better services by design

The Better Services by Design (BSBD) project was the final case study of the UCHD project and started in December of 2012. The aims of the BSBD project were, therefore, two-fold: first, to refine the UCHD approach (and supporting resources etc.) to make them more effective and 'adoptable' (i.e. enhance the ability/likelihood of their uptake within the NHS) and second, to explore the value of the UCHD methodology as a contribution to health service planning and development.

The project lasted 12 months and two projects involving three organizations accessed design support and mentoring.

Design methods

The projects were supported with a range of online resources (www.bsbd.org.uk), and face to face mentorship and were encouraged to follow the Double Diamond design process (2013) (see Figure 1) to guide their activities. The Double diamond has four phases, namely:

- discover: which involves opening up and questioning on the focus for innovation in the project, including understanding service-users' experiences and preferences;
- define: where the most important issues to tackle in your project are agreed;
- develop: where different ways of tackling the problems are explored by designing possible responses as prototypes and testing ideas in the context; and

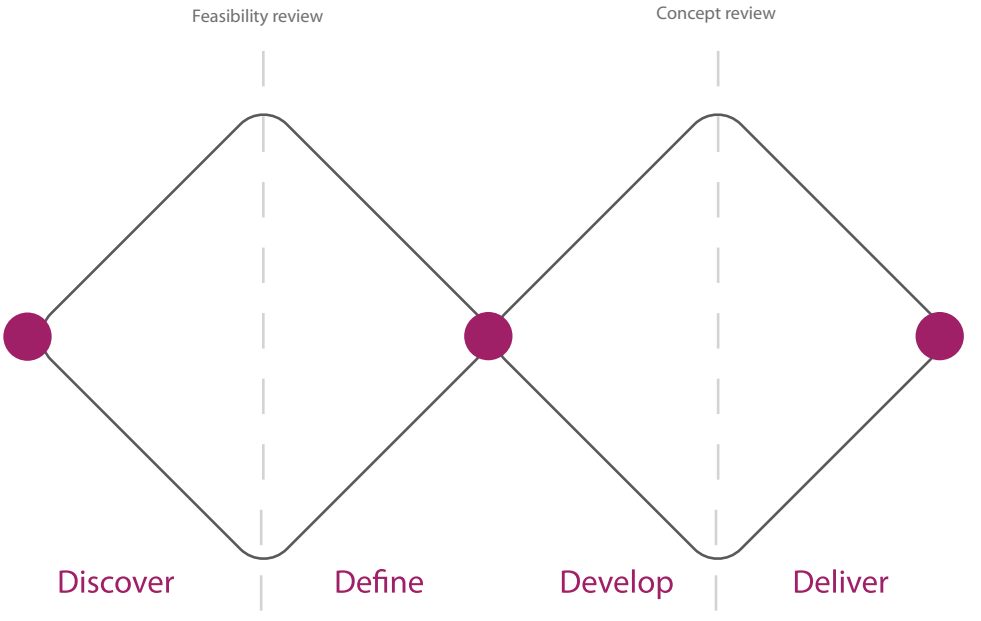

Figure 1. The Double Diamond (adapted from British Design Council).

- deliver: which involves producing practical, working solutions and implementing them.

There was a strong focus on participatory, co-design methods throughout, with explicit activities around stakeholder identification and then creative methods to allow meaningful participation.

Four organizations were initially recruited for the BSBD project through a series of awareness raising workshops. They were encouraged to submit project plans that outlined the objective for their project, identify some key stakeholders and determine possible governance implications. Ethics approval was granted by Sheffield Hallam University Art and Design Research Centre Ethics Committee for the overarching research. The local service improvement activity was not assessed to require full NHS Ethics approval.

The organizations were brought together in learning sets where the design research team explained the research, shared an online reflection tool, gained consent and outlined the overarching design approach that would guide the individual projects. One organization did not continue after the initial 'kick off' event leaving two projects with three participating organizations. The two remaining projects are described below. Early on it became clear that the partners were not keen to engage with the formal online reflection tool provided, and so a decision was taken to support the reflection through regular phone interviews.

A range of outcome evaluation measures were collected (to be reported elsewhere) to explore the specific aims of the overarching BSBD project. This paper

explores the reflections of participants during the project. Primary findings from analysis of reflection interviews are presented and discussed in relation to change management and innovation theory.

Methods

Research design

The research design, of this aspect of the wider BSBD project, is a qualitative inquiry using reflective telephone interviews of participants.

Sample and setting

Project 1 was led by members of the public health team in a local authority. The aim of the project was to use a lakeside area close to a business and retail park to promote health and wellbeing. Key stakeholders were the wider Local Authority (which employs about 7000 people), local businesses, the local professional football club, a leisure centre, and an existing stakeholder group. The research participants were the public health lead, a public health worker, and a local authority worker.

Project 2 involved a mental health charity that employs around 11 staff and the local branch of a national NHS mental health initiative, which employs 130 people. The goal of the charity and the NHS organization was to improve the service provided to 16-18 year olds for accessing and navigating mental health services. The key stakeholders were young people, NHS referrers, commissioners and other voluntary sector groups. The research participants were two NHS workers[1], the NHS service manager, the Chief Executive Officer (CEO) of the charity, and a charity staff member.

All participants gave informed consent to take part in the study and for their telephone interviews to be transcribed and analysed. The interviews were undertaken by one of the design researchers and took place after each learning set or significant project event. Interviews were loosely structured around the questions: 'What has happened? What had you hoped / expected to happen? What do you plan to do next?'. Participants were not constrained and could talk through anything relating to the research process, the other partners or their own project. A total of 32 interviews were carried out over a six-month period. Interviews were audio recorded and transcribed verbatim.

Data analysis

A framework approach (Ritchie and Lewis 2003) was used for analysis of the transcripts. Dedoose (version 5.0.11), a web based qualitative analysis application, was used to manage and code the data (SocioCultural Research Consultants LLC 2012).

The framework approach consists of four phases:

(1) initial data familiarization by listening to interviews, reading and re-reading the transcripts;
(2) a thematic framework is identified, reviewed and then systematically applied to all of the text (indexing of the data);
(3) the data is then rearranged into charts according to the appropriate thematic reference or codes based on each organization's data; and
(4) finally mapping and theorising is applied to the data as a whole (Ritchie and Lewis 2003).

To minimize bias, a researcher who was not involved in the original project led the framework analysis (author 2). This researcher worked independently until the first thematic framework was proposed. This was discussed and checked with members of the original research team (authors 1 and 3) and developed further until consensus on themes was achieved.

The indexing of the data was completed and excerpts to illustrate each section were presented back to the wider research team. A further round of discussion led to two themes being merged and renamed.

The charting process matched themes against the individual organization's characteristics.

Results and discussion

Six main themes were identified. These were; design practice, collaborative working, creating an environment for innovation, organization and staff culture, team skills and attitudes, and transfer of knowledge.

Design practice

The three organizations appeared to embrace design practice and creativity in different ways.

The data suggests that the local authority and charity responded positively to the way the design approach encouraged the development of simple ideas leading to realistic, achievable solutions. In fact simplicity was considered essential by the charity, to help keep the NHS organization engaged with the project. The flexible and holistic nature of creative working resonated with the charity and fitted in with the way that they liked to work. The charity had previously used art and performance in their work. In contrast it was quite a shift in thinking for the Public Health Lead who came from a more qualitative research background.

> *Made me understand just how practical design can be… a lot of the things that you're suggesting are very practical things that will lead to an outcome.* (Public Health Lead)

> *We didn't need to all become sort of qualitative researchers … I … quite liked that, a little bit of insight and then an imagination worked really quite well.* (Public Health Lead)

The local authority found some of the design techniques, such as actually walking through the environment you want to change, invaluable. This was a different way of working for them and demonstrated how simple and effective some of the creative design methods were. Other examples were using photographs and social media as a means of gathering data, and running a participatory workshop rather than a traditional focus group or meeting.

> *… the walk around the lake was really useful and … the lesson to me … was how helpful it was to be physically in the environment that you were trying to change and to kind of observe it and see other people, sort of step back and see other people's view of it*. (Public Health Lead)

Design methods seemed to stimulate the organizations to adopt a wider perspective on the service they were hoping to improve. It stimulated the charity and NHS organization to question the way they do things and consider a more positive approach to problem solving. Methods that had particular impact here were around the identification and engagement with wider stakeholder groups through either existing groups or new data collection using creative methods.

> *Well, it certainly got me thinking about there's wider things here and that … pushes you to ask different questions that you might not have asked before*. (Charity CEO)

In addition the creative methods encouraged an inclusive, bottom up approach. Both the local authority and the NHS organization described highly hierarchical staff structures. The design approach, with its focus on participation, had a profound effect on the working practices of the local authority in particular. They involved staff from all levels / grades in their project development and changed the structure of their project meetings to a less formal and less management led format. Conversely The NHS organization appeared to have the two workers running the project with little support from the wider team.

> *I think it's made us, I think the meetings have probably been more democratic and communicative … it's been much more of a creative free for all and people have been able to kind of put things up and the sort of the, the flow of the meeting has been more informal and that's, I think that's been quite good*. (Public Health Lead)

Collaborative working

During the project the designers and their methods encouraged the teams to take a collaborative approach to the way that they worked. This included the learning set approach to knowledge translation, allowing each project to share experiences and learn from the other.

> *… it's useful to learn from other people and to share experiences. Because it was good to hear the other projects, … understanding other people's projects and where they were and what the difficulties might be and hearing the sort of, the practical 'oh you could do this stuff' was interesting.* (Public Health Lead)

… we have got ourselves on the agenda to go to the [stakeholder group], but basically to go along with packs in terms of the cultural probes… . we are going to do some communication with them between now and then but the main, key thing was to get on the agenda. (Public Health Lead)

This was alongside the broader drive to involve a wide range of stakeholders in their own project activity. There is evidence of service user and wider stakeholder collaboration within the local authority and charity work. However, this is less evident from the NHS organization.

I think that … really influenced him in … He did sort of say to me at the end, you know I have realized that actually we need to do something and maybe think about having a more sort of bespoke service for young people which was something that he'd been really resistant to before. So that was a real shift in his thinking. (Charity CEO about NHS Manager)

I think he saw that the participation has been really good and that actually there were ways of involving young people in services design, service redesign and was saying to me you know would you be interested in working with us on wider service. [Charity CEO about CAMHS (Child and Adolescent Mental Health Services) manager]

Creating an environment for team innovation

The design approach seemed to help those involved to develop and be open to innovation. The support given by the design researchers appeared to be valued by all three organizations and assisted in keeping the projects focused and on track.

… we've sort of been really helped, you know hand held through the project in a really positive way and its been relatively straight forward and quite motivating to everybody … cause its sort of something a bit different. (Public Health Lead)

And I think we had really good support through you guys, which is really helpful. (NHS Worker 1)

In addition, the designers helped to bring a fresh perspective and new ideas. All three organizations appeared to enjoy being challenged to think and work differently, but this seems to have been particularly embraced by the charity and the public health team. The double diamond approach was readily adopted by these two organizations and was valued in guiding the different stages of their projects. The iterative nature of the process appealed to the charity's way of working, whereas the structure to the process appealed more to public health lead's style of project management.

I think for us, as an organization, the whole thing was really, really useful because it helps us to think about how you can use things like forum theatre, cause that was really helpful. (Charity CEO)

And the overwhelming thing for me was, I like a theory in a framework so, the double diamond stuff made a lot of sense, … I can see where I am in the sort of process and I think it's also a concept that's relatively easy to sell to other people, that this is why we're doing it in this particular way and this is the stage we're at and that. (Public Health Lead)

Organization and staff cultures

The data suggests that organizational cultures had an impact on the organizations' abilities to progress the projects and in some instances suppressed creativity and innovation.

Lack of time was a common issue that arose for all three organizations. This sometimes generated frustration and affected participants' ability to progress their projects.

> *So, I think one of the challenges we have, nobody of us has ever enough time to spend on it.* (NHS Worker 1)

> *So just trying to meet your deadlines now is quite difficult. And I have sent an email to D and S today to just say, you know, I know you're under a lot of pressure, I know your funding is running out, I know you've got to complete, … by certain times, but just bear in mind that, you know, … there's a lot of pressure on us now.* (Charity CEO)

The charity clearly found working with an organization constrained by bureaucracy and apparent inflexibility challenging.

> *But it sounds ridiculous, doesn't it? But it's the bureaucracy within organizations. I mean, we've got around it. And I think particularly within the health service, there are lots of things like that aren't there? There are so many protocols and processes and ways of doing things and I understand that, you know, the bigger the organization the more they need them, but sometimes that just makes the practicalities of doing things really difficult.* (Charity CEO)

The workers from the NHS organization appeared quite entrenched in their attitudes, and resistant to the new methods of working, even towards the end of the process when compared to the other two organizations. This, along with the change in project worker part way through, appeared to have a negative impact. So much so that the charity feared the solutions proposed during the project would struggle to be implemented.

> *I think a lot of the problem was that there's not that realization there that actually you know we are not a young people's service. What we are trying to do is that we are trying to adapt how we work but we can't change how we work erm you know we can't completely change the way that we work, you know, I don't like going to my GP, well that's the way we are commissioned and that is not something that we can actually change you know because we are an adult service and not a young person's service.* (NHS Worker 2)

> *The only thing I'm worried about is that we'll do this work and nothing will change. That would be my only worry – that we could do all this work and then they'll go, yes, thank you very much, but, you know, you're not going to do anything.* (Charity CEO)

Individual skills and attitudes

Individual team members possessed a range of pre-existing skills and confidence, specifically around undertaking research and using technology. These

existing skills appeared to impact on their readiness and ability to accept and deliver elements of the service improvement process.

The public health lead was an experienced researcher, confident in recruiting and collecting data. She described the simplicity of the design approach as both novel and appealing.

> *I think for me the collecting of stories and not necessarily needing to analyse them in a lot of detail… you know my background is qualitative research and obviously you spend a lot of time analysing the data but the act of collecting the stories and kind of looking at them in a more superficial way, not quite the right word, but you still have the essence of what the issues are and using your own sorts of observations of the issues as well.* (Public health lead)

The charity CEO, whilst very confident in her own field, initially expressed anxiety at working in new ways (particularly with information technology). This anxiety quickly diminished as the project moved forward supported by and enjoying the challenge of the new.

> *… the positive is that it's a different way of working and it's a learning curve then. … So you're learning something new; you're learning how to do something differently. And that's always a good thing.* (Charity CEO)

NHS worker 1 was worried by her lack of experience, felt she needed more support to work effectively, and expressed discomfort with the uncertainty.

> *I think because (Charity CEO) and me, we are completely inexperienced… I think sometimes what would have been good when we had the first meeting, … if we had been more clued up about it, how you guys think, because it is a very specific way of working and thinking and I think that's what we need.* (NHS Worker 1)

Transfer of knowledge

This final theme indicates how the organizations have responded to the methods adopting them in other areas of their work.

The local authority team were already thinking of disseminating their project results to a national audience, and the charity CEO was drawing on relationships built in the project to influence other services connected to their organization. Both the local authority and the charity were considering using the methods in future projects.

> *I think the local authority will really take notice of some of that consultation and so there is a real chance that they will use it in future, … they've got some real say on what happens in the Lakeside area because they can sell that land in a particular way or they can give planning permission in a particular way and that's, so if they use some of what we find out for future consultation or instead of future consultation.* (Public Health Lead)
>
> *He also said I'm really impressed by the way the young people have been involved in this and I'm interested in looking at how we can look at young people's involvement in all of*

the stuff that we do, not just within the sort of mental, not just within XX but you know within the hospital services and that kind of thing. (Charity CEO)

There is, however, no evidence from the data to indicate whether the NHS organisation plans to use any of the methods and processes from the project in the future.

Relating emergent themes to existing innovation literature

There is already an established body of work investigating factors and processes to develop innovative teams (Amabile 1988; West et al. 2004; Sacramento, Chang, and West 2006). During the latter stages of framework analysis the research team identified West et al.'s (2004) work which seemed to demonstrate strong theoretical resonance with the emergent themes and situate the design practice in the wider organizational management literature. The authors undertook a further stage of analysis, exploring the emergent themes and framework through the lens of West's integrated model for team innovation (Figure 2) to explore the particular contribution of design to

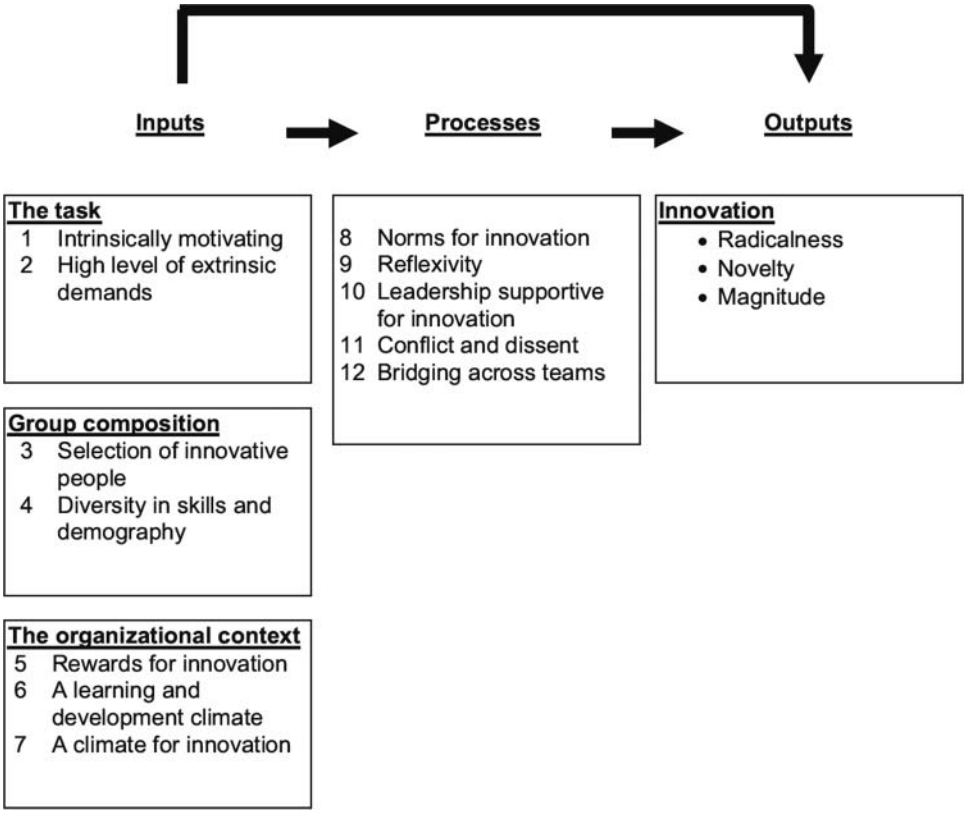

Figure 2. An input–process–output model of team innovation.

develop a bridge between emergent co-design theory and practice and established academic work.

West's model draws attention to a variety of inputs and processes. The inputs regard the task itself, the team who are to undertake the task, and the organizational context (organizational) in which they operate. Figure 2 summarizes the model.

The task

West argues that tasks that are intrinsically motivating but are set in a context of a high level of extrinsic demand contribute to innovation. As the design process used different methods, it was clear that members of the different organization found these engaging and intrinsically rewarding. Sacramento, Chang, and West (2006) suggest that tasks that are varied and use different skills are more motivating along with tasks that involve group rather than lone working. The data shows that the participatory and creative design methods supported participants' engagement with the project, as did the challenge of learning and experiencing novel techniques. The extrinsic demands of the timetable of the BSBD project also influenced the task.

Group composition

West's model demands innovative people and a diversity of skills and demography. Although the project did not set out to deliberately attract innovative people, the open recruitment process might have had a bias towards creative and innovative people. Also within West's work (2004) he states that a key factor around team composition is to identify people with a 'high tolerance for ambiguity' (278). The results have shown that the project leads in the local authority and charity were much happier to work in this way than those from the NHS organization perhaps explaining the varying levels of engagement.

There was much evidence that the involvement of the design team broadened the range of skills available to the teams, and that some of these skills and techniques were transferrable. Thus the design process helped broaden the diversity and skills of all those involved.

The organizational context

All the participants found the hands on presence of the design research team empowering in terms of both practical and intellectual support. Where required the design team would create props and prototypes, and commission theatre productions to support the individual teams' goals. This was seen as important to the perception of the projects both within and without the host organizations.

The person-centred and creative methods were seen as very powerful which had a profound effect on the learning and development climate of all

organizations. All three stated that it had changed perceptions and raised the profile of 'service users' in a way that traditional methods would not or had not previously.

Even though the Local Authority clearly had well developed relationships with wider stakeholders prior to the start of the BSBD project, the design methods seemed to facilitate more productive stakeholder engagement. They allowed the involvement of an important stakeholder group that had been perceived as resistant to change in the past through the use of design methods and facilitation.

Processes

West et al.'s model draws attention to: norms for innovation, reflexivity, leadership support for innovation, conflict and dissent, and bridging across teams.

The participatory design methods did not happen in isolation, and the design of the wider BSBD project provided support for innovation processes, whilst the action learning sets offered a behavioural norm for innovative behaviours. Reflexivity is not necessarily core to the design approach but was core to this project and was perceived as a powerful and positive tool. The participatory approach demanded that 'outside' voices were heard, which West et al. describe as a powerful driver for change. Finding ways to enable stakeholders' voices to be heard often involved creative thinking. For example, forum theatre was used based on interview narrative of young people with experience of mental health services, when young people would have found it challenging to express themselves directly to service providers. Bridging to diverse stakeholders also prevents group think (the process of natural consensus in homogenous groups) (Sacramento, Chang, and West 2006) by supporting and necessitating the interaction between the disparate groups involved.

Limitations

The study only had a small number of participants which potentially reduces the generalizability of the results, and the original purpose of the interviews was to illicit reflection on action rather than a guided interview on innovation in teams. However, as the analysis was emergent from the data the validity of the findings were intrinsically rather than extrinsically derived. The subsequent choice of West's work on organizational change and innovation was a far more subjective decision by the authors, but it provided a useful lens through with to view emergent findings and position them within an established literature.

Conclusions

The BSBD study aimed to support teams in health and social care to co-produce innovative solutions using a creative, participatory, design led methodology. This approach was received differently in the different organizations, due to

contextual factors, but also due to participants' ability and readiness to work in new ways. This paper has used Framework analysis to first explore the participants reflections and then used the lens of West's Innovative team model to situate the design practice in the wider and more established organizational and psychological theory and literature.

The characteristics of the main participants and their organizations may be important influences on their capacity to innovate. The results indicate that the design methods, despite influencing the organizations differently, did influence all in a positive direction towards greater innovation capacity.

Advocates of design in healthcare highlight the contrast between design's explicit 'bottom up' approaches and the top-down approaches to delivering change that are typical in large public service organizations such as the United Kingdom NHS (Pattison 1996; Damanpour and Schneider 2009). Innovation literature (Campbell 2008) suggests that top-down approaches to change produce negative effects including poor staff morale, stifling of ideas and lack of individual autonomy, generating change resistant environments. The bureaucratic cultures common in such organizations present further barriers to successful change (Pattison 1996; Damanpour and Schneider 2009; Damschroder et al. 2009; Schifalacqua, Costello, and Denman 2009). It is suggested that design-led methods encourage an environment of collaboration and flexibility, stimulating more creative thinking, resulting in more practical, successful and implementable solutions (Robert et al. 2015; Thomson, Rivas, and Giovannoni 2015). This paper adds to that literature.

Innovation is challenging, particularly in large bureaucratic organizations (Pattison 1996). Introducing design methods into service improvement does not change this. However, this analysis of the reflections of teams being mentored in a design led approach to health service improvement suggests that this approach can help to establish conditions that are conducive to innovation.

Implications for practice

NHS staff are resourceful and, if supported, can often find ways to overcome challenges in their day to day working practice. Design, and specifically co-design, is an approach that draws upon a wide range of different practices to enable staff to move beyond improvement to innovation. Whilst the amount of design practice in health is increasing there is a lack of evidence to support how design delivers this change. We need to continue to not only deliver design in health projects but also to deliver well designed and robust evaluations of both the process and outcome if we are to see the potential benefits shared and scaled across health and social care.

Note

1. There was a change of personnel half way through the project.

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Notes on contributors

Daniel Wolstenholme undertook a first degree in neuroscience before training as a nurse. During this time, Dan completed an MMedSci in nursing and healthcare studies and lectured on pre- and post-registration nursing courses within the School of Nursing at the University of Sheffield. Following this, Dan worked in research management and governance in Chesterfield and Sheffield Hospitals before taking up his role as project manager and clinical researcher on the UCHD project within CLAHRC SY and subsequently, the roles within CLAHRC Yorkshire and Humber, as core team manager, communications lead and theme manager for the translating knowledge into action theme. Dan's own research interests lie in exploring the potential of the theory and practice of design in healthcare. He is a visiting researcher at Lab4-Living and holds an honorary contract with the School of Nursing at the University of Sheffield.

Cheryl ***Grindell*** has a BSc (Hons) degree in physiotherapy and has worked in a variety of NHS settings since 1992 specialising in musculoskeletal outpatients. In 2014, she undertook the NIHR funded MSc in clinical research where she got her first taste for design in a health care setting whilst working on placement with the user centred health care design project team at Sheffield Hallam University. She has since continued to work both clinically in the NHS and within research. Completing secondments with CLAHRC SY and within ScHARR at the University of Sheffield. She is about to start working as part of the TK2A team within CLAHRC YH and holds an honorary contract with ScHARR.

Andy Dearden is a professor of interactive systems design at Sheffield Hallam University, UK. His research deals with participatory methods for designing systems that can deliver social, health and economic benefits for individuals and communities. Andy has published widely on how effective design practices, specialist design skills and good design ideas can be shared to allow people who are not specialist designers to devise workable and appropriate systems for themselves. He has led participatory innovation with private, public and third sector organizations, as well as grassroots community groups in the UK, India and Africa.

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